

ABSTRACT OF THE DISCLOSURE

A method for treating liquid includes directing a pressurized stream of the liquid into a cyclone apparatus having an inlet closed to the atmosphere and a submerged outlet. A liquid vortex is formed along an inner surface of the cyclone apparatus, and a central portion defined by an inner surface of the liquid vortex is substantially evacuated of gases to create a near vacuum condition. Treatment gas may be selectively added to the liquid vortex through the evacuated central portion. Photon energy may be directed through the evacuated central portion and into contact with the treatment gas, or the liquid vortex. Pressure levels within the evacuated central portion are measured using a pressure sensor or gauge. Upon exiting the cyclone apparatus, the liquid is subjected to collision and cavitation forces.